

Having described the invention, we claim the following:

1. A pressure relief valve for relieving air pressure from a passenger compartment of a vehicle, the pressure relief valve comprising:

    a base having a central portion and a peripheral portion, a plurality of openings extending through the base;

    a plurality of flaps for closing the openings of the base, each flap being associated with at least one opening of the plurality of openings and including opposite surfaces against which air pressure acts, an inner end of each flap connected with the central portion of the base and an outer end of each flap being movable relative to the central portion of the base and the other flaps in response to differential air pressure acting on the opposite surfaces for enabling airflow through the at least one associated opening; and

    a connector on the base configured for securing the pressure relief valve to the vehicle.

2. The pressure relief valve of claim 1 wherein the connector is a rim that is molded onto the peripheral portion of the base, the rim including structure for securing the pressure relief valve to the vehicle.

3. The pressure relief valve of claim 2 wherein the structure of the rim includes first and second members, the first member adapted to engage and seal against an interior surface of the vehicle and the second member adapted to engage and seal against an exterior surface of the vehicle.

4. The pressure relief valve of claim 1 further including a fastener for fixedly securing the inner end of each flap to the central portion of the base.

5. The pressure relief valve of claim 4 wherein the fastener is molded into a hole in the central portion of the base, the fastener including a head portion that overlays at least part of the inner end of each flap for fixedly securing the inner end to the central portion of the base.

6. The pressure relief valve of claim 5 wherein the connector is a rim that is molded onto the peripheral portion of the base, the rim and the fastener being molded from identical material.

7. The pressure relief valve of claim 1 wherein the central portion of the base is planar and the peripheral portion of the base is frustoconical and extends upward and radially outwardly from the central portion of the base, the plurality of openings extending through the peripheral portion of the base.

8. The pressure relief valve of claim 7 wherein the peripheral portion of the base includes a surface which supports the outer end of each flap in a closed position closing the at least one opening, the peripheral portion of the base enabling movement of the outer end of each flap in a first direction relative to the surface and preventing movement of the outer end in a second direction, opposite the first direction, for enabling airflow through the at least one opening in only the first direction.

9. The pressure relief valve of claim 1 wherein the peripheral portion of the base further includes a support portion which intersects the plurality of openings and supports the outer end of each flap when the flap is in a closed position relative to the base.

10. The pressure relief valve of claim 1 wherein the inner ends of the plurality of flaps collectively form an undivided center portion of a flexible closure member, the outer ends of the plurality of flaps being separated from one another by slots, the slots enable movement of the outer end of each flap relative to the outer end of adjacent flaps, the flexible closure member being formed from a single sheet of material.

11. The pressure relief valve of claim 10 wherein the peripheral portion of the base includes a first alignment member and the center portion of the flexible closure member includes a second alignment member that is adapted to cooperate with the first alignment members for positioning the flexible closure member relative to the base.

12. The pressure relief valve of claim 1 wherein each flap of the plurality of flaps includes at least one hinge that connects the inner end of the flap with the outer end of the flap, the at least one hinge enabling movement of the outer end of the flap relative to the inner end.

13. The pressure relief valve of claim 12 wherein the at least one hinge is at least one narrow portion of material formed between slots in the flap.

14. The pressure relief valve of claim 1 wherein each flap of the plurality of flaps is tends to return to a closed position relative to the base for closing the at least one associated opening so that the pressure relief valve operates independent of gravity.

15. A method of forming a pressure relief valve for relieving air pressure from a passenger compartment of a vehicle, the method comprising the steps of:

providing a base having a central portion and a peripheral portion, a plurality of openings extending through the base;

closing the openings of the base with a plurality of flaps by associating each flap with at least one opening, connecting an inner end of each flap with the central portion of the base, and enabling an outer end of each flap to move relative to the central portion of the base and the other flaps in response to differential pressure acting on opposite surfaces of the flap for enabling airflow through the associated at least one opening; and

providing a connector on the base that is configured for securing the pressure relief valve to the vehicle.

16. The method of claim 15 wherein the step of providing a connector on the base that is configured for securing the pressure relief valve to the vehicle further includes the steps of molding a rim onto the peripheral portion of the base, and molding structure on the rim for securing the pressure relief valve to the vehicle.

17. The method of claim 16 wherein the step of molding structure on the rim for securing the pressure relief valve to the vehicle further includes the steps

of molding a first member that is adapted to engage and seal against an interior surface of the vehicle, and molding a second member that is adapted to engage and seal against an exterior surface of the vehicle.

18. The method of claim 15 wherein the step of connecting an inner end of each flap with the central portion of the base further includes the step of providing a fastener for fixedly securing the inner end of each flap to the central portion of the base.

19. The method of claim 18 wherein the step of providing a fastener for fixedly securing the inner end of each flap to the central portion of the base further includes the steps of molding a fastener into a hole in the central portion of the base, and overlaying at least part of the inner end of each flap with a head portion of the fastener for fixedly securing the inner end to the central portion of the base.

20. The method of claim 19 wherein the step of providing a connector on the base that is configured for securing the pressure relief valve to the vehicle further includes the steps of molding, from identical

material as the molded fastener, a rim onto the peripheral portion of the base, and molding structure on the rim for securing the pressure relief valve to the vehicle.

21. The method of claim 15 further including the steps of providing the plurality of flaps as a flexible closure member formed from a single sheet of material having an undivided center portion formed from the inner ends of the plurality of flaps and the outer ends of the plurality of flaps being separated by slots.

22. The method of claim 21 further including providing the peripheral portion of the base with a first alignment member, and providing the center portion of the flexible closure member with a second alignment member that is adapted to cooperate with the first alignment members for positioning the flexible closure member relative to the base.

23. The method of claim 15 further including the step of providing each flap of the plurality of flaps with at least one hinge for connecting the inner end of the flap with the outer end of the flap and enabling

movement of the outer end of the flap relative to the inner end.

24. The method of claim 23 wherein the step of providing each flap of the plurality of flaps with at least one hinge for connecting the inner end of the flap with the outer end of the flap further includes the step of forming slots in the flap to form at least one narrow portion of material, the narrow portion of material being the at least one hinge.

25. The method of claim 15 wherein the step of providing a base having a central portion and a peripheral portion, a plurality of openings extending through the base further includes the step of providing a support portion which intersects plurality of openings and supports the outer end of each flap when the flap is in a closed position relative to the base.

26. The method of claim 15 wherein the step of closing the openings of the base with a plurality of flaps further includes the step of forming the plurality of flaps from a material having a tendency to return the flaps to a closed position closing the

openings of the base so as to form a pressure relief valve that is independent of gravity.